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ABSTRACT

Resource allocation processes suitable for use in not-for-profit institutions are discussed and a conceptual model for resource allocation in institutions of higher education is presented. The objectives of higher education include the personal development and education of students, not merely the certification of students by conferring degrees. In order to evaluate the extent to which these qualitative objectives have been obtained, some indicators other than simple measures of quantitative outputs are required. Such indicators are needed as input to the administrative process for use in planning effectively and efficiently and in allocating resources to the various alternatives intended to achieve the defined objectives. A review of the literature concerned with the planning and resource allocation process in non-profit environments is presented. A conceptual mode is developed which demonstrates a means by which administrators may incorporate data and information about student outcomes in the planning and resource allocation process. The model uses student inputs, institutional environmental characteristics, and student outcomes in a process designed to develop and implement programs and activities designed to accomplish defined goals and objectives. These variables are evaluated in a feedback link against desired levels defined in the initial steps of the process. A scheme for developing and collecting the kinds of information needed for the analytical evaluation of program impact on students and for integrating that information into the planning and resource allocation process is provided. The theoretical bases for the model are discussed. (SC)

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THE USE OF STUDENT OUTCOMES IN RESOURCE ALLOCATION DECISIONS

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THE USE OF STUDENT OUTCOMES IN RESOURCE ALLOCATION DECISIONS

ABSTRACT

After differentiating between the concepts of efficiency and effectiveness, the author presents a discussion of several resource allocation processes used in not-for-profit institutional environments. It is concluded that there are no such processes which incorporate effectiveness criteria related to such concerns as student outcomes. A conceptual model is then described which incorporates information about student outcomes, as well as economic and fiscal information in the planning and resource allocation process. This model is then supported by reference to the theories of decision-making.

THE USE OF STUDENT OUTCOMES IN RESOURCE ALLOCATION DECISIONS

In the administrative process, one of the most central activities has to do with decisions on how to distribute the limited resources of an organization in order to best meet its objectives. In the decision-making process leading to the distribution of resources, many possible alternatives compete. It has been suggested elsewhere [5] that these alternatives must be evaluated with respect to the two major criteria of efficiency and effectiveness. It is argued that the criterion with which alternatives have traditionally been evaluated was efficiency. This is defined as the ratio of outputs to inputs. It is an emphasis of quantifiable outputs related to the quantifiable inputs, often labor dollars or hours.

But another criterion is also said to be important in the evaluation of various alternatives. Effectiveness is defined as the degree to which an activity attains the objectives for which it was designed. This criterion has often been overlooked and deemphasized in favor of efficiency. In organizations where the objective is to be profitable, efficiency can be said to be effectiveness by definition; and the accomplishment of efficiency becomes effectiveness. However, in organizations which are organized for the purpose of providing many and varied services, rather than for making a profit, efficiency and effectiveness take on separate and distinct meanings. Therefore, non-profit organizations must be evaluated in terms of both efficiency and effectiveness.

The recent interest in productivity of government agencies and programs is a reflection of the efficiency movement in non-profit environments, as is the accountability movement in higher education. Unfortunately, most efforts in this regard overlook the distinction between efficiency and effectiveness. Productivity in the non-profit sector is also seen as outputs over inputs [8]. But the outputs considered are limited to quantifiable sorts of variables. Such items as visits made by a social worker, reports written, contacts made, or degrees conferred are examples of such quantifiable indicators of outputs. The resistance to these sorts of quantifiable outputs stems from the fact that they do not reflect the qualitative nature of such activities. The objective served by a social worker is to provide for the welfare of clients, not simply to visit them. The objectives of higher education include the personal development and education of students, not merely the certification of students by conferring degrees.

In order to evaluate the extent to which these qualitative objectives have been attained, some indicators other than simple measures of quantitative outputs are required. In addition, the administrative process can then use this sort of information to plan efficiently and effectively, and to allocate resources to the various alternatives intended to achieve the defined objectives.

Colleges and universities represent a large sector of the non-profit enterprises in this country. Both public and private institutions are attempting to provide services designed to achieve a mission having to do with the education and development of students. Very few of them are concerned with making a profit in the process. The service they provide is their reason for

being; but they are making planning and resource allocation decisions on the basis of information which is primarily related to the fiscal and quantifiable variables discussed above. Rarely is information directly related to student outcome objectives used in the decision-making process in higher education.

One of the characteristics of institutions of higher education is that they are labor-intensive entities. In order to increase productivity and efficiency, it is necessary to increase the ratio of students, class enrollments, and/or degrees awarded per labor unit. Very little can be done to increase productivity by increasing the use of capital-intensive technologies, without significantly affecting educational goals and missions, which are not easily quantifiable. However, because little has been accomplished in measuring and integrating the non-quantifiable outcomes of higher education, the total effects of efforts to increase productivity can only be guessed. The costs of more efficient and productive institutions, in terms of effectiveness, must also be evaluated in making decisions about resource allocation.

While there have been several projects which developed measures of some of the non-quantifiable outcomes of higher education, as reported elsewhere [5], they have not been widely adopted within the administrative decision-making process of higher education. Micek, of the National Center for Higher Education Management Systems, acknowledged that the link between the measurement of educational outcomes (which his research group has pursued in detail) and their use in the administrative decision-making process, is undeveloped [1]. This makes the measurement efforts reviewed in other resources [5] limited to being research tools, not an aid in the administration of higher education.

This paper initially presents a review of the literature concerned with the planning and resource allocation process in non-profit environments. This background information will focus on methods which provide for the possible application of measures of student outcomes. Upon this base, a conceptual model will be developed, the purpose of which will be to demonstrate a means by which administrators may incorporate data and information about student outcomes in the planning and resource allocation process. The various elements of this model will be presented in detail so that interested administrators may begin to operationalize the model for themselves and their particular environmental constraints.

This is a conceptual, not an operational, model. The situational variables that interfere with implementation of generalized models must be dealt with on an individual basis. It is the purpose of this generalized, conceptual model to provide a framework, and background information, about the suitability of various approaches and measures. The specific application in any given institution will have to be adapted to the unique characteristics of that situation. The model is intended to provide the focus; the creative administrator must provide the situational analysis which can act as a basis for the adaptation and utilization of student outcomes in the planning and resource allocation process.

Finally, the model will be justified and supported by concepts and theories of the decision-making process.

Review of Planning and Resource Allocation Literature

Many approaches to the planning and resource allocation process in higher education have been presented in the literature. Some of these procedures are designed to integrate financial and fiscal information, primarily with respect to inputs. However, some of the approaches allow for the input of information from both outputs and inputs of the organization. It is these latter methods which will be the focus of attention in this review.

Among the various approaches are: those which could be classified as budgetary in nature [2, 3, 17]; others in government based on Management by Objectives [8. p. 139-141]; an input-output model offered by Astin [1]; Policy Analysis discussed by Balderston [2]; and an Outcome Oriented Planning Model presented by Micek and his colleagues [12].

The budgetary models include: PPBS as discussed by Weathersby and Balderston [17] and later Balderston [2]; zero-based budgeting, also discussed by Balderston [2]; and the "Objectives, Strategies, and Tactics" budget presented by the Change Panel on Academic Economics [3]. These budgetary approaches to planning and resource allocation are all designed to implement resource allocation and planning with institutional goals and objectives. However, either by experience (PPBS), or in approach, there has been little success in so doing [2,17]. The planning and resource allocation process must look elsewhere to find techniques or methods of planning, which can be used to integrate goals and objectives into planning, as well as into budgeting. The budgeting process is obviously a necessary component of the planning and

resource allocation process, but it does not seem to have accomplished the objective of this study -- that of integrating the non-fiscal, non-quantitative student outcome goals and objectives into the formal planning and resource allocation process.

Another technique discussed by the same two researchers [2, 17] is that of Policy Analysis. It is presented as a less formalized approach than PPBS and Zero-based budgeting, and becomes almost a philosophy rather than a structured, technological tool.

Another set of approaches are based on Management-By-Objectives [8]. They seem to be oriented toward the use of goals in the planning process, but they lack the structure to formally allocate resources.

Astin [1] presents a model which is designed to integrate tudent inputs with institutional environments as they effect student outcomes. Once again, this model fails to integrate a formal structure for the allocation of resources.

Finally, Micek and his colleagues [12, pp. 4-10] present an "Outcome-Oriented Planning, Management, and Evaluation Cycle." This model is a framework for planning the programs of an institution based on the objectives, stated as outcomes, which are used to evaluate program effectiveness (as opposed to efficiency). The authors acknowledge that the model is only conceptual in nature, and suffers from many shortcomings which inhibit its implementation.

None of the procedures, techniques, or analytical tools discussed above seems to accomplish the objective of integrating the use of student outcome information into the planning and resource

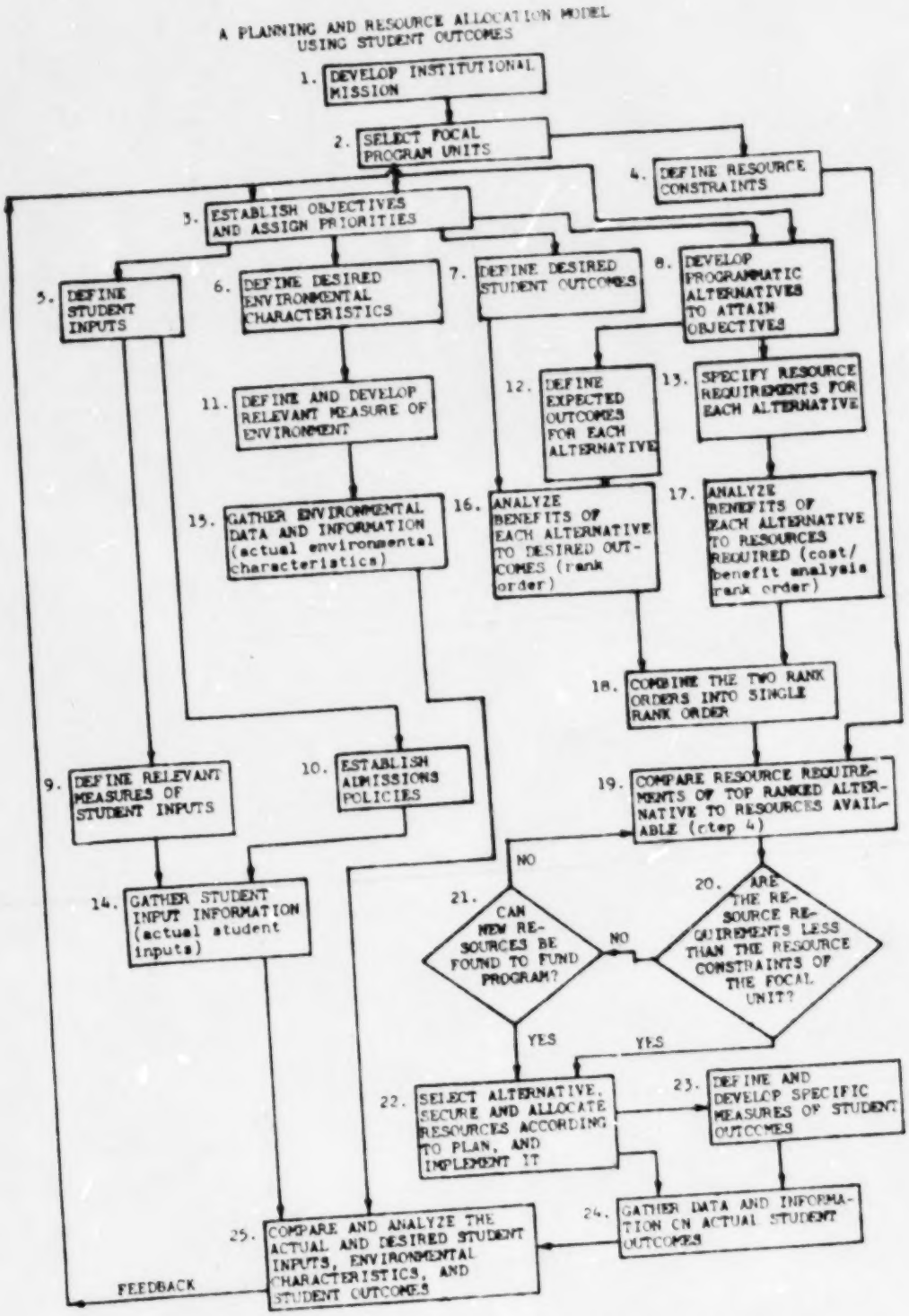
allocation component of the administrative decision-making process. While other works [5] discussed the major projects aimed at measuring student outcomes, neither there, nor in this review of planning and resource allocation strategies, has there been a comprehensive integration of these two subjects. It follows that there has not yet been a significant attempt to provide a framework which can operationally be adopted by the practicing administrator, one which accomplishes the objective of integrating student outcome information with the planning and resource allocation component of the administrative decision-making process in higher education. It is the purpose of the next section of this chapter to present a proposed framework which does accomplish such an objective.

Description of a Proposed Conceptual Model

The model proposed in Figure One represents an integration of the planning and resource allocation component of the administrative decision-making process with the measurement and use of student outcomes. In general, it is concerned with using student inputs, institutional environmental characteristics, and student outcomes in a process which has the purpose of developing and implementing programs and activities designed to accomplish defined goals and objectives. These variables are evaluated in a feedback link against desired levels defined in the initial stages of the process.

The conceptual background of this model does nothing to limit, or restrict, the application of it to any institution of higher education, whether small or large, of limited purpose or multiple

Figure One


A PLANNING AND RESOURCE ALLOCATION MODEL USING STUDENT OUTCOMES
1. DEVELOP INSTITUTIONAL MISSION
2. SELECT FOCAL PROGRAM UNITS
3. ESTABLISH OBJECTIVES AND ASSIGN PRIORITIES
4. DEFINE RESOURCE CONSTRAINTS
5. DEFINE STUDENT INPUTS
6. DEFINE DESIRED ENVIRONMENTAL CHARACTERISTICS
7. DEFINE DESIRED STUDENT OUTCOMES
8. DEVELOP PROGRAMMATIC ALTERNATIVES TO ATTAIN OBJECTIVES
9. DEFINE RELEVANT MEASURES OF STUDENT INPUTS
10. ESTABLISH ADMISSIONS POLICIES
11. DEFINE AND DEVELOP RELEVANT MEASURE OF ENVIRONMENT
12. DEFINE EXPECTED OUTCOMES FOR EACH ALTERNATIVE
13. SPECIFY RESOURCE REQUIREMENTS FOR EACH ALTERNATIVE
14. GATHER STUDENT INPUT INFORMATION (actual student inputs)
15. GATHER ENVIRONMENTAL DATA AND INFORMATION (actual environmental characteristics)
16. ANALYZE BENEFITS OF EACH ALTERNATIVE TO DESIRED OUTCOMES (rank order)
17. ANALYZE BENEFITS OF EACH ALTERNATIVE TO RESOURCES REQUIRED (cost/benefit analysis rank order)
18. COMBINE THE TWO RANK ORDERS INTO SINGLE RANK ORDER
19. COMPARE RESOURCE REQUIREMENTS OF TOP RANKED ALTERNATIVE TO RESOURCES AVAILABLE (step 4)
20. ARE THE RESOURCE REQUIREMENTS LESS THAN THE RESOURCE CONSTRAINTS OF THE FOCAL UNIT?
21. CAN NEW RESOURCES BE FOUND TO FUND PROGRAM?
22. SELECT ALTERNATIVE, SECURE AND ALLOCATE RESOURCES ACCORDING TO PLAN, AND IMPLEMENT IT
23. DEFINE AND DEVELOP SPECIFIC MEASURES OF STUDENT OUTCOMES
24. GATHER DATA AND INFORMATION ON ACTUAL STUDENT OUTCOMES
25. COMPARE AND ANALYZE THE ACTUAL AND DESIRED STUDENT INPUTS, ENVIRONMENTAL CHARACTERISTICS, AND STUDENT OUTCOMES
NO
NO
YES
YES
FEEDBACK

purposes. Therefore, even administrators of large, multi-campus systems could adapt this model in macro terms. However, the presentation that follows is much more micro in nature, directed more toward the small, limited purpose institution as a whole, or the college level unit at a university.

Preliminary Steps -- Steps One and Two

The first two steps of the model are preliminary, serving the purpose of directing the attention of the central actors in the process toward the particular point of interest in the process. This assists in focusing the efforts of participants on the relevant issues. The first step, developing institutional missions, is a prerequisite to any activity on the part of administrators. The mission supplies a focus within which people are able to concentrate their efforts. This mission statement is very broad in nature, and may be a description of the utopia toward which the institution will strive. It does not require explicit, specific planned outcomes, but rather serves to limit the activities of the institution to those which are central to a generalized focal point.

Often the institutional mission statement is imposed on it by outside agencies, such as legislatures in the case of public institutions, or by sponsoring religious orders in the case of many independent institutions. It is from this general statement that the various components of the institution are developed to assist in the effort of attaining the institution's mission. Mission statements may, on the other hand, be developed inductively through inputs from the various institutional constituencies, which are then analyzed to determine what the diverse components of the

institution view as the most appropriate role for the institution to serve. Whether the mission is developed inductively, or externally imposed, it is the integrating concept that guides the many and varied activities of the institution.

The second step, selecting the focal program unit, is the administrator's attempt to direct efforts toward one phase of the institution at a time. In order to successfully plan for the activities that are undertaken, each program or activity should receive the direct attention of the administrator. Which specific institutional program is to be highlighted is open to the discretion of the administrator. It may be as broad as one of the colleges or as narrow as one of the degree programs. The focus could be on some specific student life program or on the entire student life area all together. The "Program Classification Structure" (PCS) put forth by Micek and associates is an example of the kind of breakdown that might assist an administrator in defining separate focal units within an institution. "The PCS defines a hierarchy of organizational and program units ranging from the total institution down to individual program elements such as courses." [12, p. 141]. Any of these "program units" are appropriate as focal units for this model. The choice is dependent on the purposes of the decision-maker.

Steps Three and Four

Once the focal unit has been selected, two major steps must next be pursued. The establishment of unit objectives and priorities is Step Three. The other, Step Four, is the definition of the resource constraints which exist for that particular program

unit. These become prerequisite activities to the planning and resource allocation process. It is necessary to know precisely what is to be accomplished by a particular program unit; and it is also necessary to know what resources are at hand before any of the subsequent program development steps can be undertaken.

Step Three -- The objective-setting process can be the critical activity in the planning process. Until explicit and specific objective statements exist, the activities undertaken by a program unit most likely will be undirected and disjointed. The separate biases and understandings of the various personnel lead to a fractionalized approach, and the results tend to be uncoordinated. However, based on the mission statement of the institution, the personnel of the focal unit are able to propose several clear, explicit, and precise objectives which characterize the program. This implies a decidedly inductive strategy for the development of objectives. It is a particularly appropriate approach for a student-driven institution. The people involved with the operation of the focal program unit, including faculty, administrators, students, alumni, and so forth, are as well qualified to specify unit objectives as any other particular group of people; and their involvement in developing them will foster acceptance and commitment, thereby encouraging their involvement in the strategies to be developed to accomplish them.

One of the methods which may be employed in this effort might be the use of potential goal statements. Members of the various constituencies of the program unit can react to the statements concerning their perceived current importance as well as to their normative judgement about how important the goal should be.

Results of such a strategy provide a list of items which indicate those areas which are perceived to be most important, and a list of items which are perceived to be least likely to be attained. From the inductive analysis of these lists, it becomes possible to infer the specific objectives of the program unit.

The list of items to which respondents may react empirically can either be internally generated or developed from several such lists already developed in the literature [6, 14]. It is possible to employ The Delphi Technique to generate some consensus among respondents about the importance and urgency of the various items [4]. Internally developed items should be developed from a representative sample of members of the focal unit. Techniques which might assist one in accomplishing such a task include brain-storming or the use of nominal grouping [4]. Those whose responsibility it is to obtain such lists must constantly be able to limit the attention of the respondents to the overall institutional mission so that the ultimate list reflects items which are congruent with the overall mission.

Step Four -- Concurrent to the development of program unit objectives is the effort of Step Four to define the resource constraints of the unit. This step is primarily concerned with ongoing units which already exist, and therefore possess certain resources, both financial and human. It is the purpose of this step to acknowledge and explicitly state these resources. In the case where specially skilled human resources are required for a potential program, it is important to determine whether or not any people with those specialized skills are available to the program. The availability of facilities and equipment can also be

determined in such a step. This step implies a strategy in which the focal units exist and are currently allocated some specific amount of resources, which might be considered to be the "minimum increment above zero" of the zero-based budgeting approach. Adding or shifting of activities must be done with respect to the base of resources already available to the program unit. Additional resources which may be needed by the focal unit will be justified by the planning and resource allocation process steps of this conceptual model.

Four Phases -- Steps Five, Six, Seven, and Eight

From Step Three, the establishment of objectives and priorities, this model branches to four separate phases. Three of the four are designed to determine the desired state of the several variables relevant to the planning and resource allocation process. Student inputs, environmental characteristics, and student outcomes represent the major variables and sources of data for administrators. The other phase at this point is the central activity of the planning process, the development and choice of alternative programs which may achieve the focal unit's objectives.

Step Five -- The first phase to be discussed is Step Five, that of defining the desired student inputs. Because of the positive relationships among the characteristics of students entering an institution or program with the institutional environment and the student outcomes of the programs (as discussed in the previous chapter), it is important for planners to consider the characteristics of students who are likely to experience success in a program or institution related to the goals and objectives

specified previously in Step Three. Once this step has been accomplished, the admissions staff can determine relevant policies, and begin recruiting appropriate potential students, as specified in Step Ten. Concurrently, in Step Nine, the measures of student inputs can be developed which reflect the kind of information that is of concern to the planners in achieving their goals and objectives. Finally, in Step Fourteen, as students actually enroll in programs which are implemented, the actual measurement of the student input characteristics can be made, and the information gathered for analysis, both separately and in comparison to the environmental and outcome information that is also to be gathered.

Step Six -- The second phase at this stage is Step Six, the definition of the desired environmental characteristics of the institution that would be expected to foster the attainment of the focal unit objectives. College environment factors would include those suggested by Pace in his development of the College and University Environment Scales (CUES)[13]. These are subjective perceptions by community members regarding such dimensions as practicality, community, awareness, propriety, scholarship, campus morale, and the quality of teaching and faculty-student relationships. Also included in the topic of environment could be more objective characteristics, such as size, sponsorship (public or independent), percentage of professional training programs versus liberal arts programs, and percentage of faculty with terminal degrees. In Step Eleven, the means of measurement of these desired environmental characteristics must next be determined; and finally, in Step Fifteen, the actual gathering of environmental data and information must take place for both separate and

comparative analysis with the student input and student outcome data and information. As an example, a defined general objective of helping students better prepare for an occupational career is a possible result of Step Three. It might lead to the specification of a desired environmental characteristic, such as providing accessibility to a number of people engaged in a variety of occupations and professions, in Step Six. Step Eleven could be the development of a scale that lists a number of occupations, asking students to respond by indicating whether or not they have had an opportunity to talk with a person working in any of the occupations in the past six months. The actual administration of the scale to students is an example of Step Fifteen.

Step Seven -- The third phase at this stage is Step Seven, which is concerned with the definition of the desired student outcomes congruent with the focal unit objectives. Depending on the previously established focal unit objectives, the desired student outcomes might include such items as student attitudes about the program, student values, aspirations, perceptions, or student success (perhaps defined as becoming employed in desired profession, or money earned in first job). Those outcomes which reflect the focal unit objectives are candidates for inclusion in the list of desired student outcomes. This step is limited to the definition of outcomes which are congruent with the goals and objectives specified in Step Three. The development of measures of student outcomes is postponed until Step Twenty-three.

Alternative Generation and Evaluation

However, before the specification of the measurements to be used to gather student outcomes, the fourth phase of this stage

must be considered. Because not all program alternatives can be expected to achieve 100% of the desired student outcomes, the measurement of specific student outcomes is going to be a function of both the particular program implemented and the desired outcomes. Therefore, in Step Eight, the various alternative programs must first be defined and developed. This is the central step in the planning and resource allocation process. It is here that separate proposals must take shape; and the specific policies and procedures, as well as the operational activities, must be made explicit. This phase demands creativity and collaboration among planners. People other than administrative planners may be invited, at this point, to suggest and develop alternatives which may be appropriate for the focal unit objectives and the desired student outcomes. In this phase, the use of participative strategies provides the opportunity for the involvement of those people who are most likely to participate in the implementation of the selected alternative(s). Such group techniques as brainstorming and Program Planning using nominal grouping and/or Delphi processes are appropriate [4]. The major purpose of this step is to develop as many alternative programs as possible. The evaluation of alternatives must be delayed and specifically separated from this step in order to promote many diverse possibilities from which to choose.

Steps Twelve and Thirteen -- The next two steps of this phase, Twelve and Thirteen, can be undertaken concurrently. The first activity is Step Twelve, to develop the expected student outcomes for each alternative program or set of programs. Having specified in detail the operational activities of the alternatives in the

previous step, the expected outcomes of each of them must then be determined. This can be accomplished through research and forecasting, both theoretical and empirical. Managerial experience and technical approaches can be used to specify the likelihood of the expected outcomes for each alternative. For instance, a program implementing a more developmental advisement system could have associated with it several possible outcomes, each with different likelihoods of occurrence: facutly-student relationships may be perceived to be more satisfactory by students; students may choose majors earlier in their college career, and switch majors less frequently; misadvice and mistakes regarding students' programs may decrease; or faculty may refuse to devote the required extra time. Each possible outcome must be evaluated in terms of its probability of occurrence and listed for each of the several programs developed in the previous step.

The other step within this phase, Step Thirteen, is to develop and specify in detail the resource requirements of each alternative. This involves forecasting the demand of the alternative, establishing the needed human resources, supporting facilities, and equipment required, and determining an accurate estimate of the price tag associated with the established resources. These resulting financial estimates take the form of budgets, in order to facilitate the planning and evaluation steps which follow.

Steps Sixteen and Seventeen -- The next two steps of this phase, Sixteen and Seventeen, involve the evaluation of the several program alternatives in terms of two criteria: potential goal attainment and cost effectiveness. Each of these evaluation steps includes a ranking of the various alternatives based on the

potential ability of the particular alternative to attain or meet the criteria.

One of the criteria is the attainment of the desired student outcomes which were defined in Step Seven. In Step Sixteen, each alternative must be judged in terms of its likelihood of achieving the desired student outcomes which were defined for the focal unit's objectives. The result of this step is a rank-ordered list of all the alternatives, or even groups of alternatives. This rank order judgement may have to be a simple subjective judgement by administrators, or could well be the result of considerable empirical research and theory development. In any case, the rank order must reflect both the completeness of objective achievement and the amount of risk and uncertainty involved in each alternative.

The concurrent step at this point is Step Seventeen, the appraisal of each of the alternatives in terms of outcomes related to inputs. This becomes a cost/benefit analysis, in which expected outcomes are related to the resources required for a given alternative, resulting in a judgement about the cost of the alternative as related to the particular outcomes associated with that alternative. Once the various alternatives have been so judged, they may be rank ordered in terms of the lowest cost per outcome. This results in a second list of rank ordered alternatives, this time in cost/benefit terms.

These two assessments are to be done as separate and distinct steps. The first, ranking in terms of goal achievement, is an attempt by the model to impose on the administrative decision maker the separate judgement of an alternative's potential <u>effectiveness,</u>

as distinguished in the previous chapter from efficiency. The second, the cost/benefit ranking, is an attempt to judge the efficiency of each alternative. Done properly, the administrator has two separate rankings of the various alternatives, one reflecting effectiveness and the other reflecting efficiency.

Step Eighteen -- The administrative decision maker must then weigh and evaluate the relative merits of the alternatives developed in Steps Nineteen through Twenty-two. The list of rank ordered alternatives provides an obvious place to begin. But, if the program planners have adequately done their job of developing programs designed to achieve certain outcomes, it is likely that the requirements of their best programs (that is, the alternatives ranked best in terms of both effectiveness and efficiency) exceed the resources available as defined in Step Four. Thus, the alternatives ranked best might well be eliminated from consideration. It must first be determined if the number one ranked alternative can be implemented, given the limited resources defined in Step Four. If so, that becomes the chosen alternative. If not, it must next be determined if any other resources can be developed to fund the alternative. Such sources may be found through foundation grants, research proposals, legislative action, or reallocation of resources.

This model has been presented as an isolated planning process existing to the exclusion of any other. But the reality of the planning process is that many focal units undergo the planning process concurrently. The resources required in one focal unit can be traded with others to provide for institutional optimization, rather than focal unit optimization, which may result in sub-

optimization. The resources of the whole institution may be considered when looking for funds with which to finance an alternative in Step Twenty-one.

However, if no such funding sources are available, this alternative must be abandoned in favor of the next highest ranked alternative. This circular process is continued until an alternative is finally chosen and implemented.

Once an alternative has been chosen for implementation, the development of proper measures of student outcomes can proceed (Step Twenty-three). The desired student outcomes, in conjunction with the actual alternative chosen for implementation, leads to the development and specification of appropriate student outcome measures. After the implementation of the selected alternative, and the development of the appropriate measures of student outcomes, the actual measurement of these outcomes can be undertaken in Step Twenty-four.

Analysis and Feedback of Data

At this stage of the model, there has been the development and measurement of three separate types of information designed to assist the administrator in evaluation of the planning and resource allocation efforts undertaken to achieve the objectives of the focal unit of the organization. Measures of student inputs, environmental characteristics, and student outcome information have been specified by the model. The role of the administrator is to analyze these data in terms of the desired outcomes, and to attempt to determine whether or not the program of the focal unit has had the desired impact on the students experiencing it. The results of the analysis can then be fed back into the planning

process to modify either the established objectives or the program alternatives. This implies a circular process in planning and resource allocation. The process is seen to be one which is really a never-ending function of administration, cycling through the objective setting, program development, and evaluation phases on a regular, ongoing basis.

The purpose of this section has been to describe a potential model for planning and resource allocation in higher education programs, one which uses student outcomes as well as other cost-related information. It has provided a scheme for developing and collecting the kinds of information that are imperative for the analytical evaluation of program impact on students, and for integrating that information into the planning and resource allocation process. It is thought that, by following this sort of format, administrative decision-makers might be able to attain more effectively the educational and student development objectives of higher education, while at the same time allow for the equally important efficiency constraints.

Having presented the model and described it in such normative terms, it is appropriate to justify its steps, and support its philosophy by reference to the theoretical bases upon which the model was developed. The following section of this paper will address this question.

Theoretical Bases for the Planning and Resource Allocation Model

A model such as the one presented in this paper requires more than just description. It must be elaborated upon, and it must be supported and defended on a theoretical and deductive basis.

Both the need to integrate the planning and resource allocation process with student outcomes, and some theoretical justification, can be presented to defend the prescribed steps of the model.

This model can be effectively supported by referencing the basic decision-making theories as they have been developed in the literature. Reitz and Harrison have both presented similar normative models of the decision-making process [7, 15]. They involve six or seven basic steps linked together by various sequential paths.

The first step in such models is generally concerned with the process of setting objectives and defining the scope of a problem. This is followed by the process of developing a set of alternative responses to the defined problem. Separately, these alternatives are then evaluated in terms of their likelihood of resulting in positively valued outcomes and their probability of achieving them. This evaluation is followed by the actual choice of the alternative that is determined as most likely to attain positively valued outcomes, and least likely to result in negatively valued outcomes. The next prescribed step is generally the implementation of the chosen alternative, followed by the evaluation of the results obtained by implementing that alternative. These results are then analyzed and fed back into the decision-making process, usually at a point which either allows for the re-casting of objectives or the redevelopment of alternatives.

Several criteria of good decision-making are usually posited as justifying these prescribed models. Maier [10] is concerned with both quality and acceptance when judging the outcomes of the decision-making process. He feels that, not only must the chosen

alternative be one which has a high degree of technical development, but must also be one which received the support of those most responsible for the successful implementation of it. Even good quality decisions are not likely to be successful if they are not accepted by those most impacted by them.

To the criteria of quality and acceptance, Vroom and Yetton [16] add that of time. They suggest that the decision-making process should be run in such a way as to maximize the probability of choosing a high quality, highly acceptable alternative in the least amount of time possible. While Maier's criteria were clearly related to the effectiveness of the decision, Vroom and Yetton have added the efficiency dimension.

Reitz [5] explicitly labels his criteria for a good decision as efficiency and effectiveness. He proposed efficiency criteria such as the cost of making the decision and the time which elapses between the recognition of the problem and the making of a decision on how to cope with it. The effectiveness criteria are said to be accuracy of the decision (that is, the extent to which the information is correctly evaluated, costs assessed, and benefits correctly determined), feasibility (the capability of carrying out the decision made), and support from the people required to implement the alternative chosen.

The model prescribed in this paper can clearly be supported in the terms of the theoretical material reviewed above. Given the emphasis of differentiating the efficiency and effectiveness concepts, it can be seen that the decision-making process is conceptually concerned with the same issues, even explicitly in the case of Reitz's model. The model in this paper also is concerned

with both efficiency and effectiveness criteria. The major thrust of this study is the integration of student outcomes into the planning and resource allocation component of the administrative decision-making process. This is an emphasis of the effectiveness of the process which, it has been argued earlier, has traditionally been overlooked in higher education. The determination of actual resources available, and the rank ordering of alternatives on a cost-benefit criterion, illustrate the efficiency concerns of this model.

In terms of the normative steps presented in the literature for decision-making processes, the model presented in this paper closely follows the prescriptions. Steps One and Three are explicit recognition of the prescribed necessity of developing objectives as the initial step in the decision-making process. The four phases of the next level in this model include one that is directly involved with the alternative generation, evaluation, and choice steps of the prescribed processes. Program alternatives representing the various alternatives -- as well as the rank ordering against both efficiency and effectiveness criteria, culminating in the choice of the highest ranked program alternative that can be funded -- are directly related to the like steps of the prescribed decision-making process. The gathering of information related to student inputs, environmental characteristics, and student outcomes, in addition to the comparison and analysis of that data, represent the evaluation and feedback steps of the prescribed decision-making process.

In terms of both decision criteria and the theoretically prescribed steps of the decision-making process, it can be argued

that the model presented herein is clearly an application of the concepts found in the literature. It is an adaptation of prescriptive models to the specific situation of planning and resource allocation in the administrative decision-making process in higher education.

Summary

The purpose of this paper has been to discuss the current level of development of decision-making process in higher education, especially with regard to its integration of student outcomes. A description and discussion of a proposed model for accomplishing such results was also presented.

It was concluded that current processes are not developed to include, in any systematic way, student outcomes. The proposed model was thus developed to overcome that shortcoming. It is recognized that many methodological problems exist which must be confronted and acknowledged before the model can be meaningfully employed.

Finally, a theoretical defense and justification of the proposed model was presented. The model was said to be congruent with current literature regarding the prescribed steps in decision-making processes, and that the proposed model recognized the prescribed criteria of decision successes: effectiveness and efficiency.

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